

## ABSTRACT

The present invention is a method and apparatus to remove the adverse effects due to the imbalance between in-phase (I) and quadrature (Q) channels for I-Q demodulators and modulators in multi-carrier systems. A first balancer generates a first balancing signal from a first signal of a first index corresponding to a first frequency. A first combiner combines the first balancing signal and a second signal of a second index corresponding to a second frequency. The second frequency is symmetrical to the first frequency with respect to a center frequency in a multi-carrier composite signal. The first combiner generates a first balanced signal corresponding to the second frequency.

FIG. 1 is a block diagram of a multi-carrier system according to the present invention. The system includes a multi-carrier signal source 100, a first balancer 110, a first combiner 120, a second balancer 130, and a second combiner 140. The multi-carrier signal source 100 provides a first signal 101 and a second signal 102 to the first balancer 110 and the second balancer 130, respectively. The first balancer 110 generates a first balancing signal 111, which is combined with the second signal 102 by the first combiner 120 to produce a first balanced signal 121. The second balancer 130 generates a second balancing signal 131, which is combined with the first signal 101 by the second combiner 140 to produce a second balanced signal 141. The first and second balanced signals 121 and 141 are then combined to form a balanced multi-carrier signal 150.